

AN EXPLANATORY STUDY OF GREEN BEHAVIOR UNIVERSITY STUDENTS IN UPM AND IPB UNIVERSITY

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Abstract: *Environmental performance in Indonesia and Malaysia, according to Yale University's Environmental Performance Index score, has decreased since 2018. Previous research has shown that collaborating with universities is one solution. UPM and IPB University have contributed to a sustainable environment as higher education institutions. Students are the largest campus community and the next future leaders. Environmental knowledge impacts green behavior. The purpose of this study was to analyze students' environmental knowledge, analyze the effect of subjective knowledge on green behavior factors, and analyze students as influencers of green behavior based on the Net Promoter Score. The number of samples used is 428 students. Data analysis was performed using descriptive analysis, PLS-SEM analysis, and Net Promoter Score. The results showed that the average value of objective knowledge of FEM IPB University students was higher than the objective knowledge of FEM UPM and combined objective knowledge. There is a positive correlation between subjective knowledge and green behavior. The NPS scores for both universities are negative, which means that student loyalty to recommending green behavior is not good. Therefore, making environmental subjects one of the compulsory subjects, requiring students to be involved in environmental projects, and encouraging students to carry out green activity projects are the best implications for creating green student behavior.*

Keywords: environmental knowledge, green behavior, IPB university, subjective knowledge, UPM

Abstrak: *Kinerja lingkungan di Indonesia dan Malaysia menurut skor Indeks Kinerja Lingkungan oleh Universitas Yale mengalami penurunan sejak tahun 2018. Penelitian sebelumnya menunjukkan bahwa menjalin kerja sama dengan perguruan tinggi merupakan salah satu solusinya. Sebagai institusi pendidikan tinggi, UPM dan IPB University telah berkontribusi terhadap lingkungan yang berkelanjutan. Mahasiswa adalah komunitas kampus terbesar dan pemimpin masa depan berikutnya, pengetahuan lingkungan berdampak pada perilaku hijau. Tujuan penelitian ini adalah menganalisis pengetahuan lingkungan mahasiswa, menganalisis pengaruh pengetahuan subjektif terhadap faktor perilaku hijau, dan menganalisis mahasiswa sebagai pemberi pengaruh perilaku hijau berdasarkan Net Promoter Score. Jumlah sampel yang digunakan adalah 428 mahasiswa. Analisis data dilakukan menggunakan analisis deskriptif, analisis PLS-SEM dan Net Promoter Score. Hasil penelitian menunjukkan bahwa nilai rata-rata pengetahuan objektif mahasiswa FEM IPB University lebih tinggi dibandingkan pengetahuan objektif FEM UPM dan pengetahuan objektif gabungan. Terdapat korelasi positif antara pengetahuan subjektif dan perilaku hijau. Nilai NPS untuk kedua universitas bernilai negatif yang berarti loyalitas mahasiswa untuk merekomendasikan green behavior tergolong kurang baik. Oleh karena itu, menjadikan mata pelajaran lingkungan sebagai salah satu mata pelajaran wajib, mewajibkan mahasiswa terlibat dalam proyek lingkungan, dan mendorong mahasiswa untuk melakukan proyek kegiatan hijau merupakan implikasi terbaik untuk menciptakan perilaku hijau mahasiswa.*

Kata kunci: IPB, pengetahuan lingkungan, pengetahuan subjektif, perilaku hijau, UPM

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INTRODUCTION

Rapid degradation of natural resources created by human activities has been the fundamental debate in the modern community and by global consumers with the concept of environmental commitment (Nisbet and Myers, 2007). This consciousness around environmental problems aligned pressure with the part that each subject and community in prevalent holds for the prescription of the ongoing and unfolding environment conjuncture (Paço and Lavrador, 2017). According to Yale University, the environmental performance of a country could be observed from the Environmental Performance Index score. They consist of the protection of environmental health and the protection of ecosystems. The EPI score had been published in 2006 and it passed the analysis environmental performance of 133 countries, it was increased to 178 countries in 2014 and 180 countries in 2016 until 2022. Based on the EPI assessment, countries are trying to improve environmental performance to increase the EPI score assessment including Malaysia and Indonesia. They are both developing countries in Southeast Asia and both countries that support environmental sustainability. Figure 1 shows the EPI Score of Malaysia and Indonesia as reported by EPI score by (Yale Centre for Environmental Law & Policy, 2018).

Referring to Figure 1, it is indicated that the EPI score for Malaysia and Indonesia have decreased from the previous year. The results indicated a decline in the aspects of the ecosystem vitality and environmental

health from 9 issues of EPI score assessment, namely health impact, air quality, water and sanitation, water resources, agriculture, forest, fisheries, biodiversity, and habitat, also climate and energy. According to these 9 issues, water sanitations and heavy metals are the lowest scores from the environmental health aspect, and forest issue is the lowest score from the ecosystem validity of both countries. These results show that environmental performance needs to be improved in all aspects of life in Malaysia and Indonesia, especially for the bottom three issues of EPI.

Tertiary institutions play a big role as a party that could promote and solve environmental problems. In the last few decades, universities have shown an increase in the implementation of a sustainable environmental principles (Vizek Vidovic, 2008). Basically, in 1972, the Stockholm Declaration stated that the continuous declaration related to tertiary institutions has been developed with the admission need of the tertiary institutions' contributions to environmental education (Wals Bob Jickling, 2002). University's contribution to environmental performance could be seen from the UI-Green Metric assessment initiated by the University of Indonesia. This system is a genuine measure to evaluate campus in terms of sustainability (Suwartha and Sari, 2013). Various universities in Malaysia and Indonesia participate in this program to recognize the extent of the university's contribution to the environment, among them are UPM and IPB University as agricultural campuses in these two countries. UI Green Metric score of UPM and IPB University is shown in Figure 2.

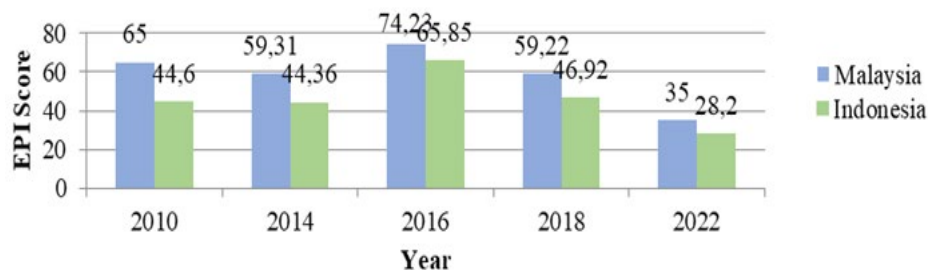


Figure 1. Malaysia and Indonesia (Jay et al. 2010) score from 2010 to 2022 (Hsu et al. 2014)

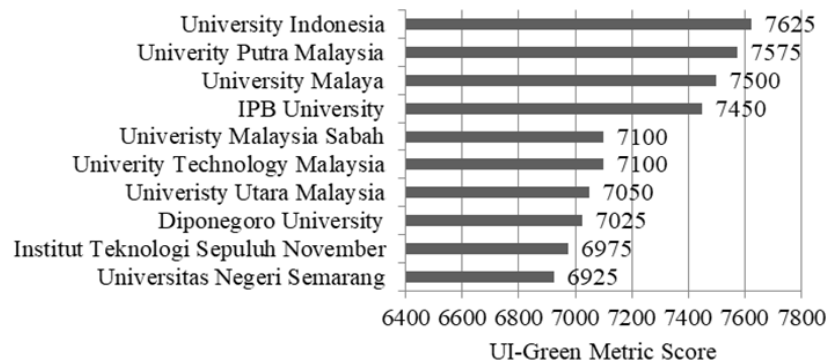


Figure 2. Top 5 Green University in Malaysia and Indonesia (UI-Green Metric, 2018)

According to Figure 2 shows that UPM and IPB University became the top 5 green campuses in Malaysia and Indonesia. This assessment was obtained from 6 aspects of UI-Green Metric assessments, they are setting and infrastructure, energy and climate change, water, waste, education and research, and transportation. Besides as top 5 UI-Green Metric in Malaysia and Indonesia, UPM and IPB University have other similarities, in particular (1) agriculture campus, (2) top 100 QS World University Ranking by Subject Agriculture and Forestry from 2016-2018, and (3) having Faculty Economics and Management to encourage the development of agriculture in the downstream sector. To implement green behavior, various efforts have been made by both universities to provide environmental knowledge to students.

Environmental knowledge helps consumers evaluate themselves for things that already do and encourages their improvement (Polonsky et al. 2012). According to Brucks (1985), environmental knowledge consists of objective knowledge and subjective knowledge. Subjective knowledge is what individuals perceive that they know and objective knowledge is what is stored in memory. Objective knowledge will enable consumers to allocate themselves consistently to their subjective knowledge (Moorman et al. 2004). Therefore, this theory can be used to indicate the students' environmental knowledge. Meanwhile, green behavior could be seen as a form of action or practice that could reduce negative environmental impact and in turn give benefits or positive impacts on the environment (Steg and Vlek, 2009). Gilg et al. (2005) divides green behavior into three indicators namely purchase decision, habit, and recycling. This theory can be used to indicate the green behavior of students at UPM and IPB University.

Many works of literature have studied the correlation between environmental education and the actual behavior and the lifestyles of the university (Zsóka et al. 2013). According to Polonsky et al. (2012) behavior could change positively along with increasing environmental knowledge, which encourages the purchase of environmentally friendly products. A previous study in the US conducted by Choi and Johnson (2019) found that there is a direct effect of environmental knowledge on someone's purchase intention of green products. Another study on one of the green products, namely organic tofu, conducted by Nugroho and Sumarwan (2015) showed that the higher the consumer's knowledge, the more likely they were to buy the organic tofu product. This shows the effect of subjective knowledge on purchase decisions. A previous study conducted by Casaló et al. (2019) showed that subjective knowledge is more strongly associated with pro-environmental behaviors such as using street trash cans, separating trash, using energy-efficient light bulbs, and using recycling centers than objective knowledge. Another previous study in New York conducted by Liu et al. (2022), found that an individual's subjective knowledge influences their recycling intention. Environmental knowledge has a positive and significant impact on environmental attitude and green purchase intention where knowledge helps them to consider the actions they will commit to the environment (Kusuma, 2018).

Based on the issues discussed above, it is important to know whether the efforts made by the two universities to improve environmental knowledge (especially subjective knowledge) affect green behavior within the universities. The purposes of this research are: (1) To analyze environmental knowledge of university students at UPM and IPB University, (2) To analyze the effect of subjective knowledge on green behavior factors (purchase decision, habit, and recycling),

and (3) To analyze students as an influencer of green behavior based on Net Promoter Score (NPS). To compare both universities in this research, surveys are conducted, environmental information and students' contributions in applying environmental knowledge in daily activities both within and outside the university.

METHODS

This study's research design sought to find links between environmental knowledge (especially subjective knowledge) and green behavior factors through a survey of students from the Faculty of Economics and Management UPM and IPB University. The research location was chosen because the Universiti

Putra Malaysia and IPB University are Agricultural Universities that support green campus or green University. The study was conducted from March 2019 to April 2019.

The primary data in this study were obtained through a questionnaire. The questionnaire made refers to the previous research which is modified according to the formulation of the problem and regional conditions that are different from the previous research. Meanwhile, the secondary data of this study is the Environmental Performance Index (EPI) data from the Yale University website, UI-Green Metric University data, literature studies and other literature from journals, thesis and internet sources related to this research. The operational variables of this study are shown in Table 1.

Table 1. Operational variables

| Variable | Definition | Code | Indicators |
|----------------------|--|------|---|
| Subjective Knowledge | Subjective knowledge is what individuals perceive that they know Brucks (1985) | SK1 | Governmental authorities |
| | | SK2 | Additional information |
| | | SK3 | Courses offered at the university level |
| Purchase Decision | Purchase decisions are activities carried out consciously to consider purchasing organic products or the willingness of consumers to acquire green products (Chen et al. 2018) | PD1 | Buy organic product |
| | | PD2 | Buy less packaging product |
| | | PD3 | Buy food product from a local store |
| | | PD4 | Buy recycled toilet paper |
| | | PD5 | Buy recycled writing paper |
| | | PD6 | Product price |
| | | PD7 | Health aspects |
| Habit | We develop routines out of habit that allow us to complete activities nearly instantly and with little conscious effort Adrita and Mohiuddin (2020) | HA1 | Reuse things |
| | | HA2 | Save water at home |
| | | HA3 | Switch off lights in unoccupied rooms |
| | | HA4 | Print documents in double face |
| | | HA5 | Separate garbage by type |
| | | HA6 | Bring bag when go shopping |
| | | HA7 | Use public transportation |
| Recycling | Recycling is a form of consumer behavior that can provide something meaningful and a kind of action that needs proper knowledge about it (Rosenthal and Leung, 2020) | RE1 | Reusable packaging products |
| | | RE2 | Donate clothes |
| | | RE3 | Donate book |
| | | RE4 | Recycle glass |
| | | RE5 | Recycle newspaper |
| | | RE6 | Recycle plastic bottle |

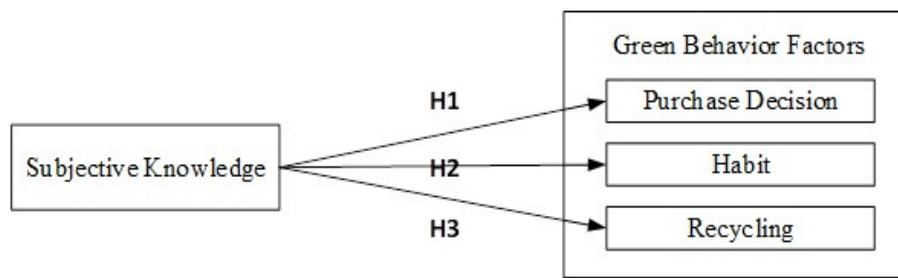


Figure 3. Research framework

Descriptive and quantitative research methods were applied, and data collection proceeded through purposive sampling. By using this technique, the first step is to determine the characteristics of the population to be taken, followed by setting specific characteristics by the purpose of the study, then taking samples by the characteristics that have been determined, and finally using samples from subjects that contain many characteristics and meet the screening criteria that have been determined, it is expected to answer the research problem.

Past literature suggests that validation to sample sizes of 300-400 respondents is acceptable (Chang et al. 2009). Barclay et al. (1995) argued that sample size considerations for partial least squares should follow the rule of thumb of 10 times the highest sum of formative indicators or structural paths to any single construct as cited in (Hair et al. 2011). Concerning these two considerations, a target sample size of 400 was found to be adequate and maintained a statistical power of 80% for identifying R^2 values of at least at 95% level of confidence (Hair et al. 2014). The total population in this study was 3391 students with 1424 specifications—being the total population of UPM Faculty of Economics and Management students and 1967 were the total population of the FEM IPB University. With these requirements, this research used 428 sample consisting of 180 samples from UPM and 248 samples form IPB University.

The data analysis applied in this research were: (1) validity and reliability test to examine the questionnaire, (2) descriptive analysis to measure and analyze environmental knowledge students, (3) Net Promoter Score to observe student feedback on green behavior, and (4) PLS-SEM analysis to observed the effect of subjective knowledge on green behavior factors with PLS-SEM software 3.0. This research framework is shown in Figure 3.

According to Figure 3, this study adapted the scale for environmental knowledge that is developed by Vicente-Molina et al. (2013) and for measuring the green behavior, the study adapted from Gilg et al. (2005), where, the study has adopted a 5-point Likert scale (Vagias, 2006) for subjective knowledge and Guttman scale for objective Knowledge. Measurement items ranged from 1 (“Strongly Disagree and Never”) to 5 (“Strongly Agree and Every time”) also true and false (Guttman scale). Based on the pilot testing, it was found that all measurement-items are valid and reliable based on the requirements with r counts $\geq r$ -table (0.296) and exceeded Cronbach’s alpha (α) threshold of 0.7 as recommended by Sekaran (2003).

Based on the model in Figure 3 could we observe in this research has a dependent variable (purchase decision, habit, and recycling) and an independent variable (subjective knowledge). The hypothesis in the research are:

- H1 : Subjective knowledge positively influence purchase decision
- H2 : Subjective knowledge positively influence habit
- H3 : Subjective knowledge positively influence recycling

Simirintiras (2006) reveals that the ability of consumers to answer questions on environmental issues correctly does not correlate with subjective environmental knowledge and purchase intention. Ellen (1994) also finds no significant correlation between either objective or subjective knowledge and recycling-based shopping decisions. Hence, it is essential to identify the types of knowledge that encourage green behavior (environmental behavior) effectively if the most efficient informational strategies are to be promoted in education (Frick et al. 2004).

RESULTS

This study is focusing on students' knowledge both objectively and subjectively about the environment and their relation to green behavior regarding students' purchasing decisions on their needs, the habit of water and energy saving, and recycling of waste goods that are close to students. The results of the analysis of the effect of subjective knowledge on green behavior are then analyzed to examine how much individual behavior could influence other students to behave the same as they do.

Respondents Characteristic

The respondents of the research are students of the Faculty of Economics and Management at UPM and IPB University. The characteristic of the respondents is divided into gender, age, major, source of income, and the number of environmental courses, as observed in Table 2.

Table 2 shows that the respondent in this research is dominated by female students from UPM or IPB University. The age of respondents dominant spread from the ages 20 to 23 years old. Analyze from students' major, most of the UPM students are in Management and while students from IPB University are mostly from Economics. Only 50.56% students in the UPM have taken environmental courses while 49.44% did not take the environmental course. While at IPB University, only

49.60% of students took the environmental courses and 50.40% did not have an environmental or ecological course.

In terms of pocket of money, majority of students from UPM and IPB University sourced it from their parents. Subsequently, in terms of the source of information about environmental knowledge and green behavior, the majority of the students used and indicated that social media is a tool to obtain considerable information and encourages them to behave green.

Descriptive Analysis for Environmental Knowledge among the students at FEM UPM and IPB University

Descriptive analysis was used to observe the average value and standard deviation of objective knowledge form both universities. Table 3 shows that the average value of objective knowledge of FEM IPB University students is higher than the objective knowledge of FEM UPM and combined objective knowledge. The value of objective knowledge obtained by FEM IPB University is equal to 7.475, this average value indicates that the objective knowledge of FEM IPB University students is higher than others. Hence, the researcher analyzes the objective knowledge and combines its correlation with respondent characteristics and subjective knowledge as could be observed in Table 4.

Table 2. Respondent characteristic (N= 180 UPM and 248 IPB University)

| Characteristics | Details | Number | | Percentage (%) | |
|------------------------------|------------------|--------|-----|----------------|-------|
| | | UPM | IPB | UPM | IPB |
| Gender | Male | 34 | 94 | 18.89 | 37.90 |
| | Female | 146 | 154 | 81.11 | 62.10 |
| Age | 18-20 | 7 | 112 | 3.89 | 45.16 |
| | 21-23 | 98 | 136 | 54.44 | 54.84 |
| | 24-27 | 75 | 0 | 41.67 | 0 |
| Major | Economics | 82 | 143 | 45.56 | 57.66 |
| | Management | 98 | 105 | 54.44 | 42.43 |
| Taking environmental courses | Yes | 91 | 123 | 50.56 | 49.60 |
| | No | 89 | 125 | 49.44 | 50.40 |
| Pocket money | Parent | 146 | 230 | 81.11 | 92.74 |
| | Scholarship | 26 | 17 | 14.44 | 6.85 |
| | Others | 8 | 1 | 4.44 | 0.40 |
| Source of Information | Social Media | 93 | 165 | 51.67 | 66.53 |
| | Book/Magazine | 7 | 13 | 3.89 | 5.24 |
| | Friend | 8 | 34 | 4.44 | 13.71 |
| | Parent | 10 | 24 | 5.56 | 9.68 |
| | Television/Radio | 62 | 12 | 34.44 | 4.84 |

Table 3. Mean and Standard Deviation of objective knowledge (N=428)

| Variable | Description | All | UPM | IPB University |
|---------------------|-------------------------------------|------------------|------------------|------------------|
| N | Number of observation | 428 | 180 | 248 |
| Objective knowledge | In the test, sum of correct answers | 7.224 (1.282) | 6.877 (1.231) | 7.475 (1.262) |

Table 4. Analysis objective knowledge with others criteria (N=428)

| Characteristics: | | Objective Knowledge: based on total correct answer (percentage) | | | |
|--|------------------|---|-------|-------|-------|
| | | <8 | | >8 | |
| | | UPM | IPB | UPM | IPB |
| Concerned with environment and green behavior (GB) | Never concern | 0.56 | 0.40 | 0.00 | 0.00 |
| | Sometime concern | 48.33 | 36.29 | 30.00 | 39.52 |
| | Always concern | 13.89 | 12.19 | 7.22 | 11.69 |
| Involved with green activity | Never | 0.00 | 3.63 | 0.56 | 5.65 |
| | Sometimes | 56.67 | 43.15 | 31.11 | 43.95 |
| | Always | 6.11 | 43.95 | 5.56 | 1.61 |
| Environmental Courses | Yes | 32.78 | 26.61 | 17.78 | 23.79 |
| | No. | 30.00 | 22.18 | 19.44 | 27.42 |
| Source of information | Television | 19.44 | 2.42 | 15.00 | 2.42 |
| | Social Media | 32.78 | 31.45 | 18.89 | 35.08 |
| | Book | 2.78 | 2.42 | 1.11 | 2.82 |
| | Friend | 3.33 | 7.26 | 1.11 | 6.45 |
| | Parent | 4.44 | 5.24 | 1.11 | 4.44 |

According to Table 4, the researcher classified the discussion into two parts, they are objective knowledge below 8 and objective knowledge above 8. Based on objective knowledge below 8, it could be concluded that: students concerned and involved with the environment and green activity are sometimes, students in both universities dominant have taken courses related to the environment, and the main sources of information in obtaining environmental information are social media. Based on environmental knowledge above 8, it can be concluded that: students' concerned and involved with the environment and green activity are sometimes, dominant students in both universities have not taken classes related to the environment, and the source of information used to obtain information is social media. relatively it could be concluded students' concern and involvement with the environment and green activity is sometimes, environmental classes do not always determine the level of objective knowledge, there are other sources of information that encourage the level of objective knowledge of students namely social media, television, book, friend and parent. Social media is the dominant source of information used in obtaining environmental information.

This result is similar to Ahamad and Ariffin (2018) who found social media as a student's source of information in obtaining any information. As social media is the most advocated primary source chosen, this simultaneously signifies the major role of the internet among millennials. Worldwide, it is one of the leading platforms to spread news and information to the public (Malik et al. 2015). This could be opportunities for stakeholders to maximize social media to provide informal education or any educational information to students because it is known that Malaysian and Indonesian internet users allocate at least 3 hours to surf social media (O' Brian, 2018).

Analysis of the Effect of Subjective Knowledge on Green Behavior with the Structural Equation Model-Partial Least Square (PLS) Approach

The analysis used in this study is the Partial Least Square (PLS) approach. PLS-SEM is used to analyze the effect of subjective knowledge on green behavior, the model, and the effect of exogenous latent variables. Exogenous latent variables in this study are subjective knowledge with three indicators namely government

authorities and mass media, additional information, and offered a course at university.

Analysis of The Outer Model

The analysis of the outer model in PLS-SEM observed how the manifest variable indicators define latent variables to be measured. In this analysis, there are three types of tests, namely convergent validity, discriminant validity, and composite reliability.

1. Convergent Validity

According to (Cressel, 2014), indicators are declared valid if the loading factor is above 0.70. If there is an indicator that has a value below 0.70 then the indicator prerequisite is deleted and a recount should be undertaken. The model and initial calculation of PLS-SEM in this research could be observed in Appendix 6. After accounting for the initial calculation, several

indicators precondition be discarded due to they have a value of loading factors below 0.70. After all not fulfilled indicators are removed, the model and final calculation of the model are obtained and it's shown in Figure 4.

It could be stated that the government authorities and mass media (SK1) do not reflect the subjective knowledge of FEM students in both universities. This suggests that the government authorities and mass media did not provide sufficient information for the environmental knowledge in influencing green behavior. Additional subjects related to the environment (SK3) is a variable that reflects the subjective knowledge of students in both universities. Whereas additional information (SK2) reflects subjective knowledge of FEM UPM students but not for FEM IPB University students. This suggests that, IPB university may need to promote students to take additional subjects especially about the environment.

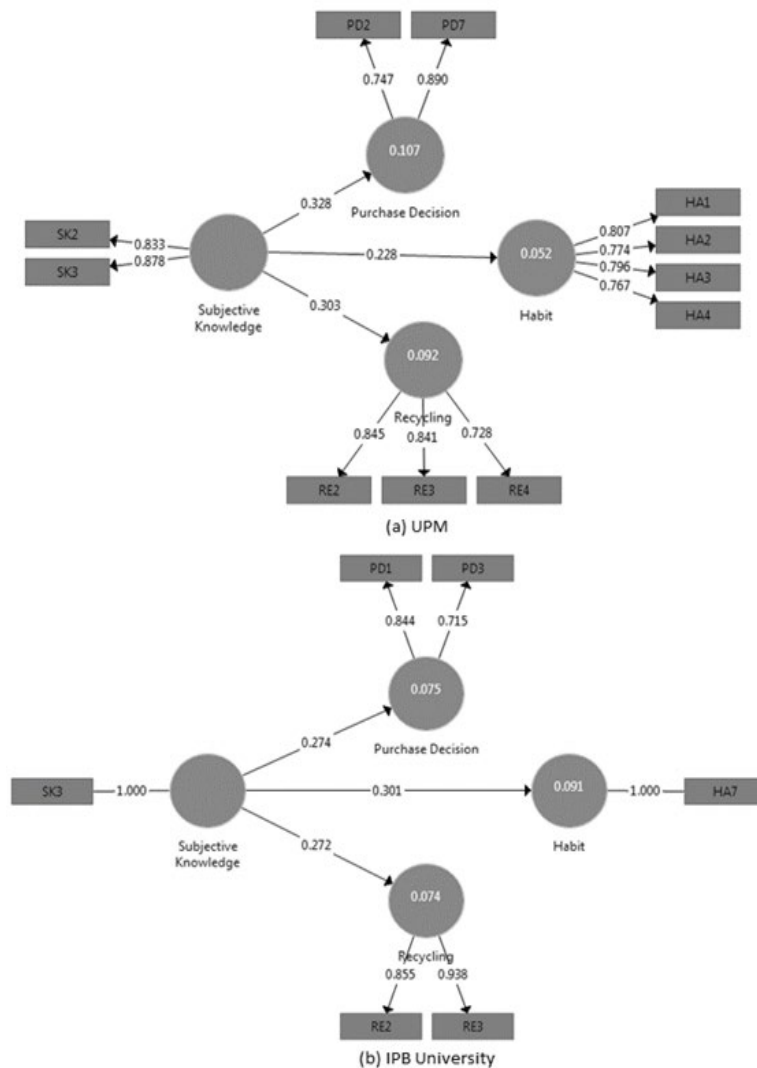


Figure 4. Model and final calculation of loading factor the effect of subjective knowledge on green behavior factors

Indicators that reflect the purchase decision variable of FEM UPM students are less product packaging (PD2) and health aspect (PD7). Students FEM UPM very cautious with these indicators but not concerned with buy an organic product (PD1) and buy a product in a local store (PD3). While FEM IPB University students concerned with organic products (PD1) and food products from a local store (PD3) and not concerned with buy less packaging products (PD2) and consider health aspects in their purchase (PD7). This shows that the price consideration (PD6) is not a problem for FEM students in both universities in deciding to buy green products. Also, Recycle paper (PD4 and PD5) has not developed into factors that are considered not important in reflecting the purchase decision in both universities.

The indicators that reflect the habit of FEM UPM students are reusing things (HA1), saving water (HA2), switch off lights in the unoccupied room (HA3), and print double face to save paper (HA4). With the highest loading value on HA1. According to these results, it could be observed that separating garbage (HA5), bring a personal bag when going shopping (HA6) and using public transportation (HA7) not turn into important factors. The indicator that reflects habit variable in FEM IPB University students is the use of public transportation for environmental reasons (HA7). While other indicators have not been factors that determine the habits of FEM IPB University students. It shows that FEM IPB students support IPB University's vision and mission in heading to Green Campus 2020 throughout using transportation provided by the university. The indicators that reflect recycling for UPM students are donating clothes (RE2), donating books (RE3) and recycling glass (RE4) and for IPB University FEM students are donating clothes (RE2) and donating a book (RE3) only.

2. Discriminant Validity

Discriminant validity is an analysis to observed whether indicators can reflect latent variables or not. The analysis could be observed based on cross-loading measurements with constructs, if the cross-loading value of the latent variable is higher than the other latent variables, it could be stated to be good. In this study, the cross-loading value of all indicators has met the criteria.

Another method in this measurement is to compare the square root of the average variance extracted (AVE) of each construct. If the AVE square root value of each construct is greater than the correlation value between constructs and other constructs in the model, it could be stated that it has good discriminant validity. Recommended AVE values requisite greater than 0.5. The following is the AVE value of each latent variable in Table 5.

Based on Table 5, it could be observed that the AVE value of all latent variables is above 0.5. It means that the AVE value of all variables is good. Whereas the comparison criteria for AVE square root values with correlation values between latent variables have also been fulfilled because the AVE root values are greater than any correlation between variables.

3. Composite Reliability

In addition to the construct validity test, construct reliability tests are measured criteria, namely composite reliability value. Constructions are declared reliable if the composite reliability value above 0.70. Besides that, it could be observed through Cronbach's Alpha value criteria. Constructions are declared reliable if the Cronbach's Alpha value is above 0.70 and above 0.60 still accepted. The composite reliability is shown in Table 6.

Table 5. The value of Average Variance Extracted (AVE) and AVE square root

| Variable | Average Variance Extracted (AVE) | | Average Variance Extracted (AVE) Square Root | |
|----------------------|----------------------------------|-------|--|-------|
| | UPM | IPB | UPM | IPB |
| Subjective Knowledge | 0.732 | 1.000 | 0.786 | 1.000 |
| Purchase Decision | 0.675 | 0.612 | 0.821 | 0.782 |
| Habit | 0.618 | 1.000 | 0.806 | 1.000 |
| Recycling | 0.650 | 0.805 | 0.856 | 0.897 |

Table 6. Composite reliability value

| Variable | Composite Reliability | | Cronbach's Alpha | |
|----------------------|-----------------------|-------|------------------|-------|
| | UPM | IPB | UPM | IPB |
| Subjective Knowledge | 0.845 | 1.000 | 0.636 | 1.000 |
| Purchase Decision | 0.804 | 0.758 | 0.530 | 0.773 |
| Habit | 0.866 | 1.000 | 0.797 | 1.000 |
| Recycling | 0.847 | 0.892 | 0.731 | 0.767 |

According to Table 6, it could be observed that all variables have composite reliability values of more than 0.7. Based on these results, it can be concluded that all latent variables are reliable. Although Chin Cronbach's Alpha Subjective Knowledge and Purchase Decision FEM UPM above 0.6, the variable is still reliable because has composite reliability above 0.7. Chin (2003) stated composite reliability is better in estimating the internal consistency of the construct. The valid construct is reliable but the reliable constructs not necessarily valid (Cooper and Schindler, 2006).

Inner Model Evaluation

This analysis performs two types of tests, they are the value of R^2 for each latent variable using the PLS Algorithm and path coefficient estimation by using bootstrapping. The R^2 value is used to explain the effect of exogenous latent variables given to endogenous latent variables, this is to observe whether there is a substantive influence or not. The calculation using the PLS Algorithm found R^2 values from the final model of the study for FEM UPM namely habit (0.052), purchase decision (0.107), and recycling (0.092). Based on these values, it could be interpreted that the variability of habit, purchase decision, and recycling constructs could be explained by the variability of subjective knowledge constructs that is equal to 5.2%, 10.7%, and 9.2%, meanwhile 94.8%, 89.3%, and 90.8% are explained by other variables other than those studied. Whereas PLS Algorithm found R^2 values from the final model of the study for FEM IPB University namely habit (0.091), purchase decision (0.075), and recycling (0.074). Confer to these values, it could be stated that the variability of the habit, purchase decision, and recycling constructs can be explained by the variability of subjective knowledge constructs that are equal to 9.1%, 7.5%, and 7.4%, while 90.9%, 92.5%, and 92.6% are explained by other variables outside the research.

The next assessment is testing the hypothesis through the bootstrapping method by producing a bootstrap image to observed the T-statistic and likewise the path coefficient used to observe the original value of the sample. The results of the bootstrapping process could be observed in Figure 5.

In the hypothesis test, to determine the positive effect of the independent variable on the dependent latent variable, it could be observed by the T-statistic value with the boundary of the T-table value for $N = 180$ for UPM and $N = 248$ for IPB University and with 95% confidence interval that is 1.66. The hypothesis could be accepted if the T-statistic value is more than 1.96 (T-Statistic > 1.96) and the opposite. The original sample serves to observe the essence of the correlation between latent variables (positive or negative). The following is a hypothesis test on research that could be shown in Table 7.

Based on Table 7, it could be observed that the correlation between variables by sight the original sample values obtained positive correlations between subjective knowledge on green behavior (purchase decision, habit, and recycling). These indicate that if the students' subjective knowledge is good, it will have good green behavior through purchase decision on green products, green habit, and recycling. According to Table 7, the P-value of all indicators of subjective knowledge less than 0.005 ($P < 0.005$), it could be stated all of the hypotheses are accepted as the subjective knowledge has a significant positive relationship with green behavior factors through purchase decision (H1), habit (H2), and recycling (H3). That's mean these results support previous research by Vicente-Molina et al. (2013) who found subjective knowledge influences environmental behavior performance. These results are also in line with research conducted by Chen et al. (2018) that suggests that subjective knowledge affects one's environmental attitudes, product attitudes, and purchase decisions. Another study that is in line with the results of this study is research conducted by Nekomahmud et

al. (2022), which states that environmental knowledge has a significant positive influence on purchasing decisions for European and non-European tourist groups. The findings of this study also align with the study conducted by Liu et al. (2022), which found that an individual's subjective knowledge influences their

recycling intention through their subjective norms, attitude toward, and controls over their own behavior and someone who has subjective knowledge considers themselves to have higher knowledge and is better able to recycle well so that it can motivate them to recycle.

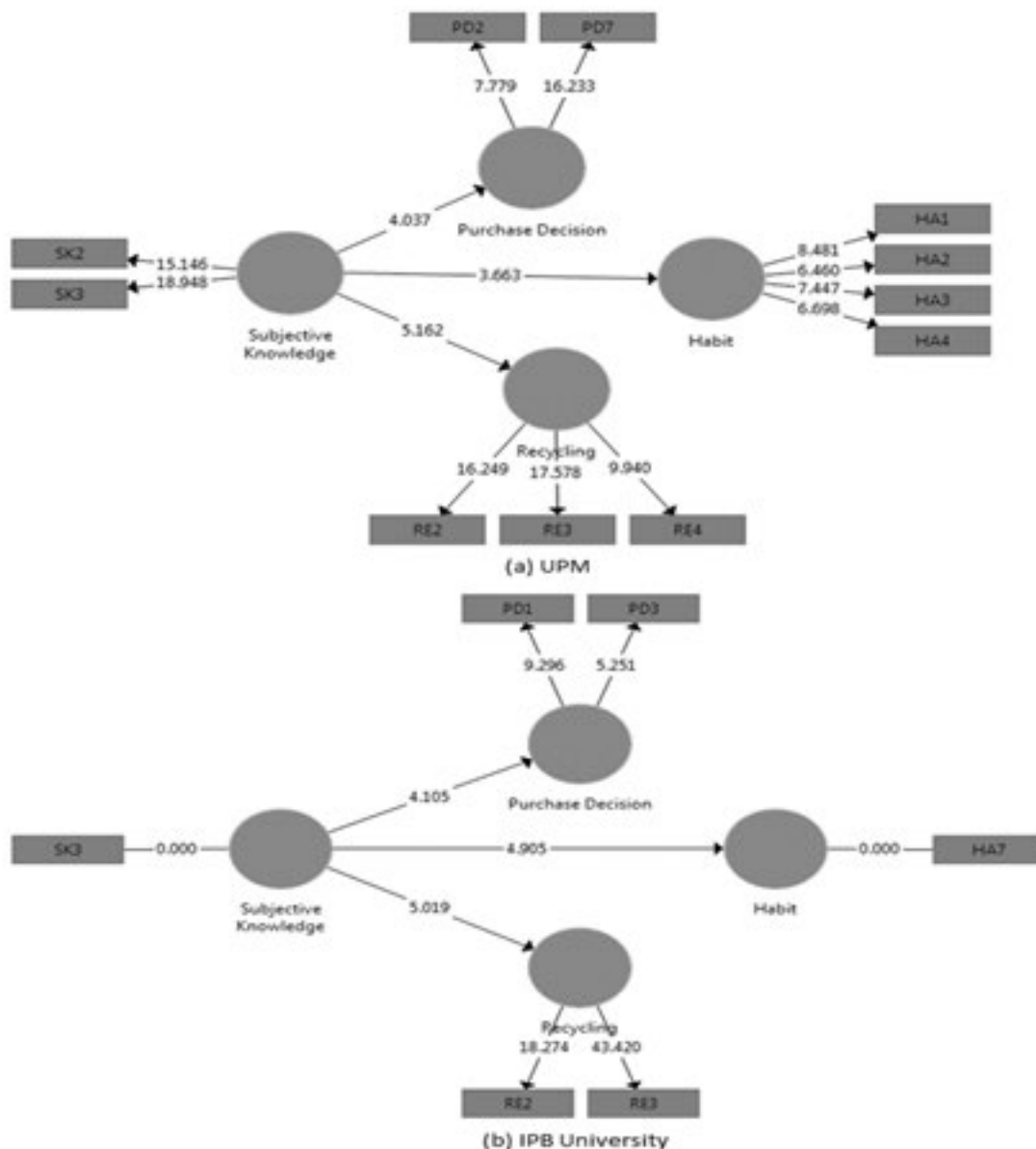


Figure 5. Bootstrapping calculation the effect of subjective knowledge on green behavior

Table 7. Result of path coefficient

| Path of influence | Original Sampel | | T-statistic | | P Values | | Hypothesis |
|--|-----------------|-------|-------------|-------|----------|-------|-------------|
| | UPM | IPB | UPM | IPB | UPM | IPB | |
| Subjective knowledge → Purchase decision | 0.328 | 0.274 | 4.037 | 4.105 | 0.000 | 0.000 | Significant |
| Subjective knowledge → Habit | 0.228 | 0.301 | 3.663 | 4.905 | 0.000 | 0.000 | Significant |
| Subjective knowledge → Recycling | 0.303 | 0.272 | 5.162 | 5.019 | 0.000 | 0.000 | Significant |

The concept of calculating NPS is the percentage of the promoters diminished by the percentage of the detractors. The NPS values for UPM and IPB University are -29.36% and -17.08%. Students' loyalty to recommend green behavior to friends, relatives, family, and other people is classified as not good and it represent unexpected results. Students should be able to become pioneers in transmitting green behavior. Based on these results, both universities still have the task of being able to encourage FEM students' interest in promoting green behavior. The dominant students of FEM UPM are a detractor and the dominant students of IPB University are passives. This is predicted to exist due to the self-consideration of students from both universities who only have partially green behavior and are involved sometimes with green activities. It is important to encourage people in the passive group to increase their involvement with green activities so that they will become promoters. This is very potential because passive criteria are people who do not tend to become promoters or detractors. Green behavioral intentions are driven by environmental concern with a solid vision to create the change (Awallia and Famiola, 2021).

Managerial Implication

Green behavior is important for the safe of our world from disaster due to greedy behavior in destroying the environment whether through direct or indirect activities. What the management can do are as follows: (1) Make the environmental subject as one of the compulsory subjects; (2) Make the students a compulsory involvement with environmental projects if they want to graduate or get additional green certificate which will add value to their employability; and (3) Educators may encourage students to do project that involve community and green activity. In terms of purchasing decisions, it is important for producers to pay attention to the health aspects of the product and replace product packaging with eco-friendly packaging. In terms of habits, it is important to increase student awareness starting by doing small habits such as doing water saving, using paper efficiently, bringing your own bag when shopping, and using public transportation. Universities can also provide separate trash can facilities to make it easier for students to separate waste. Government can make a policy of using eco-bags as a substitute for plastic bags. In terms of recycling, students can organize donation activities. Unused items can also be modified to produce products that are resaleable.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the study that has been conducted, the conclusion of the study as followed by the environmental course does not always describe the level of objective knowledge of students in both universities. The level of self-considering and involvement of students with environment activity and green behavior is sometimes, both students who know above average or below average. Meanwhile, social media is the most source of information used by students regarding obtaining information related to the environment and green behavior. The analysis shows a positive correlation between subjective knowledge and green behavior factors (purchase decision, habit, and recycling). Indicators that reflect the subjective knowledge of FEM UPM students are additional information and courses at the university. While the indicator that reflects the subjective knowledge of FEM IPB University students is additional subjects related to the environment. However, subjective knowledge is only a small part that can explain the green problem in this study. The students' loyalty to recommend green behavior to friends, relatives, family, and other people is still classified as not good.

Recommendations

Based on the results discussed above, it can be suggested that both UPM and IPB still need long ways in promoting green behavior among the students because they are well known as agricultural promoting universities in their own country. They should increase the contribution related to environmental activities through shaping the habits of students such as adding curricula related to the environment, collaborating with lecturers to develop a environmental project, and utilizing official digital media owned by the university to provide information. Meanwhile, the government and the mass media can provide sufficient information about the environment and green behavior. Further research is recommended to analyze the effects of objective knowledge on green behavior because it is one component of environmental knowledge that is not measured directly on the green.

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